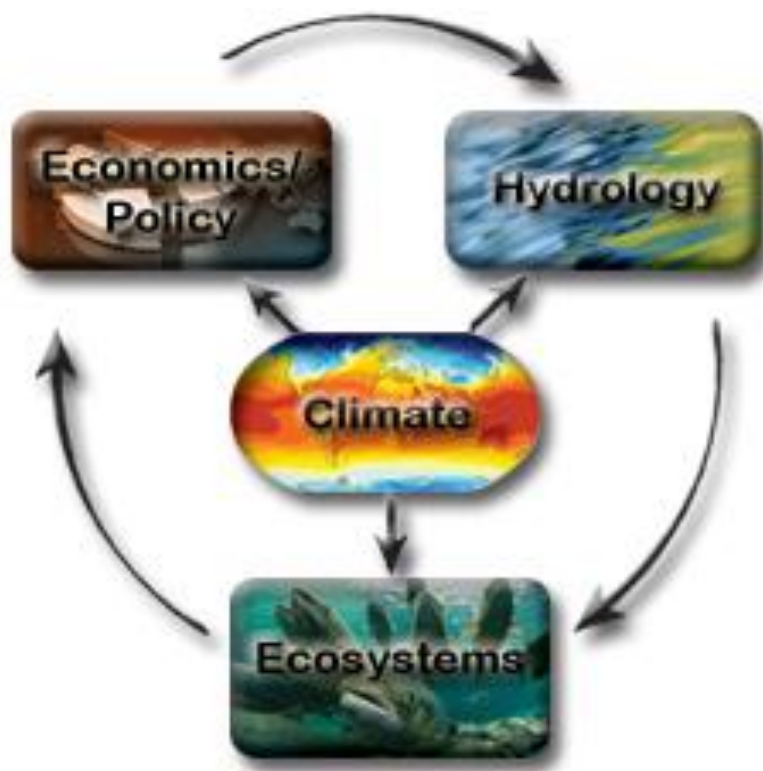


## Final Report

# Third Annual Pacific Northwest Climate Science Conference

October 1 and 2, 2012  
Boise, Idaho



Compiled by

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In Support of Pacific Northwest CESU Agreements F12AC01425 and G12AP20159  
Third Annual Pacific Northwest Climate Conference

University of Idaho

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## I. Introduction

The Pacific Northwest Climate Science Conference provides an annual forum to exchange scientific results and policy and management options related to climate change and climate impacts research focused on the Pacific Northwest. The conference, entering its third year, was held at the [Boise Centre](#) in Boise, Idaho on 1-2 October 2012. Past conferences were hosted by the [Oregon Climate Change Research Institute](#) in Portland, Oregon in 2010 and by the University of Washington [Climate Impacts Group](#) in Seattle, Washington in 2011. The conference has attracted a wide range of interested individuals including policymakers, resource managers, public agency staff, NGO personnel, and agency and university scientists.

Over the past couple of years, the conference has been supported by a broad range of research institutions, federal and state government agencies, and non-governmental organizations. This year the primary sponsor of the Conference was the University of Idaho through the Idaho Water Resources Research Institute utilizing funds provided by the US Fish and Wildlife Service through Agreement F12AC01425 and the USGS Northwest Climate Science Center through Agreement G12AP20159. Additional sponsorship for the conference was provided by:

- The Climate Impacts Group, University of Washington
- EPA Region 10
- Department of Geography, University of Idaho
- Great Basin Landscape Conservation Cooperative
- Great Northern Landscape Conservation Cooperative
- Idaho EPSCoR
- UW Joint Institute for the Study of Atmosphere and Ocean (JISAO)
- North Pacific Landscape Conservation Cooperative
- Oregon Climate Change Research Institute, Oregon State University
- Public Policy Center, Boise State University

## II. Conference Purpose and Objectives

The purpose of the Pacific Northwest Climate Conference is to increase public, state and federal agency awareness, literacy and actions to address the effects of climate change to the Pacific Northwest's natural resources, including its water, fish, wildlife, plants and ecosystems. The objectives of this conference were to:

- Provide a forum to engage resource management agencies within the Pacific Northwest region in discussions of how climate change may impact their ability to meet their missions;
- Present the latest advances in climate change research, and how these changes may impact natural and human systems within the Pacific Northwest Region; and
- Identify further research, educational and engagement activities that are needed to more effectively address the impacts of climate change across the region.

### III. Conference Activities

The Third Annual Pacific Northwest Climate Science Conference was held at the Boise Centre Conference facility in Boise, Idaho on October 1 and 2, 2012. A complete agenda of the conference is provided in the Appendix to this report, along with links to each presentation made at the conference, including papers that were presented during the poster session. Overall there were over 50 oral presentations provided at the conference.

The morning for each day of the conference consisted of Plenary Sessions. Day 1 included a welcome to the conference by the Mayor of Boise, and leaders at the University of Idaho, a key note talk by Dr. Roger Pulwarty of the National Integrated Drought Information System, followed by a session addressing climate change impacts and adaptations within the Columbia Basin. The Plenary session for Day 2 included talks addressing the latest advances in understanding Climate Variability, Assessment of Vulnerabilities to Climate Change within the Pacific Northwest, and Communicating Climate Change to a wider audience.

The afternoon sessions for each day of the conference consisted of Concurrent Technical Sessions. The afternoon of October 1<sup>st</sup> included sessions on Climate Change impacts to: the region's hydrologic systems; conservation efforts; and agricultural systems. On October 2<sup>nd</sup>, the first afternoon track addressed climate change impacts to terrestrial and aquatic systems, with the second track focusing on adaptation strategies to address climate change and how human health is being impacted by climate change.

The poster session was held on the evening of October 1<sup>st</sup>, and was well attended, with over 50 posters being presented on a range of topics including climate change impacts to: hydrology; conservation, human health, agriculture. In addition, there were several papers addressing the role of Landscape Conservation Cooperatives in addressing climate change, communication of climate change to the public and methods for assessing the vulnerability of systems to climate change.

### IV. Conference Outcomes

One of the primary goals of the conference was to provide a forum where resource managers in the Pacific Northwest region could communicate their challenges related to climate change with the scientific community researching the impacts of climate change. Thus, the conference was structured to stimulate both a place and resource based exchange of information and ideas related to climate, climate impacts and adaptation. To achieve this goal, there was a balance between presentations offered by the academic community (approximately 41% of the presentations) and governmental organizations (approximately 45% of the presentations), with the remaining 4% of the presentations provided by non-governmental entities.

The conference also focused on a combination of cross-cutting topics of relevance to multiple disciplines, as well as on clear practical applications of climate change science. Of the oral

presentations, approximately 49% focused on case studies or applications of known science to resource management issues, 41% focused on advances in understanding of climate change impacts across the region, and 10% addressed approaches to better educate and engage the broader public in discussions related to climate change and its impacts on human and natural systems in the Pacific Northwest.

Overall the meeting was well attended, with 196 registered attendees, with approximately 25% of the attendees being undergraduate or graduate students from Universities within the region, 10% being from non-governmental entities and the remaining attendees being fairly equally split between academic and governmental organizations (both federal and state) located within the Pacific Northwest. The general feedback from the conference attendees was positive, in regard to the content of the information provided, the venue and the format of the meeting.

## Appendix – Conference Agenda

### Detailed Agenda - Monday Morning, 1 October

Day 1 - Morning Plenary 8:30 am - 12:10 pm - Summit Auditorium	
<b>Introductory Session</b> <span style="float: right;">Moderator: Von P. Walden</span>	
<b>7:00-8:30</b>	On-site Registration
<b>8:30-9:00</b>	<u><a href="#">Welcome and Introductions</a></u> <i>Von P. Walden, University of Idaho</i> <i>David H. Bieter, Mayor of Boise, Idaho</i> <i>M. Duane Nellis, President, University of Idaho</i> <i>Jack McIver, Vice President of Research, University of Idaho</i>
<b>9:00-10:00</b>	<b>Keynote Presentation</b> <u><a href="#">Climate, Change and Adaptation: Are we learning?</a></u> <u><a href="#">Dr. Roger Pulwarty, Director, National Integrated Drought Information System</a></u>
<b>10:00-10:30</b>	Break
<b>Columbia Basin Impacts and Adaptation</b> <span style="float: right;">Moderator: Phil Mote</span>	
<b>10:30-10:50</b>	<u><a href="#">The Columbia River Treaty</a></u> <i>Barbara Cosens, Law School, University of Idaho</i>
<b>10:50-11:10</b>	<u><a href="#">Projections of climate change extremes in the Canadian Columbia Basin</a></u> <i>Trevor Murdock, Pacific Climate Impacts Consortium</i>
<b>11:10-11:30</b>	<u><a href="#">Potential Climate Change Impacts and Vulnerabilities to Forest Ecosystems in the West Kootenays</a></u> , <i>Greg Utzig, Kutenai Nature Investigations Ltd.</i>
<b>11:30-11:50</b>	<u><a href="#">Climate and Economic Impacts on 2030 Water Supply and Demand in the Columbia River Basin</a></u> , <i>Michael Barber, Washington State University</i>
<b>11:50-12:10</b>	<u><a href="#">Communities adapting to climate change: From dialogue to action in the Canadian Columbia Basin</a></u> , <i>Ingrid Liepa and Jeff Zukiwsky, Columbia Basin Trust</i>
<b>12:10-1:30</b>	Lunch (on your own)

## Detailed Agenda - Monday Afternoon, 1 October

<b>Day 1 - Concurrent Session A</b> <b>1:30 pm - 5:10 pm - Waters Room</b>	
<b>Hydrology</b> <span style="float: right;"><i>Moderator: Nick Bond</i></span>	
<b>1:30-1:50</b>	<a href="#"><u><b>An Overview of the Columbia Basin Climate Change Scenarios Project</b></u></a> <i>Alan Hamlet, Climate Impacts, Group, University of Washington</i>
<b>1:50-2:10</b>	<a href="#"><u><b>Mapping hydrologic sensitivities in the Columbia River Basin</b></u></a> <i>Julie Vano, University of Washington</i>
<b>2:10-2:30</b>	<a href="#"><u><b>Validation of the VIC model for streamflow metrics on western U.S. streams</b></u></a> <i>Charles Luce, U.S. Forest Service R&amp;D, Boise</i>
<b>2:30-2:50</b>	<a href="#"><u><b>Modeling hydrologic uncertainty and agricultural water security in the PNW</b></u></a> <i>Venkat Sridhar, Boise State University</i>
<b>2:50-3:10</b>	<a href="#"><u><b>The influence of mountain topography on meteorological and runoff characteristics</b></u></a> <i>Chris Tennant, Idaho State University</i>
<b>3:10-3:30</b>	Break
<b>Hydrology</b> <span style="float: right;"><i>Moderator: Lynn Helbrecht</i></span>	
<b>3:30-3:50</b>	<a href="#"><u><b>Groundwater Control of Summer Stream Temperature in the Pacific Northwest</b></u></a> <i>Tim Mayer, U.S. Fish and Wildlife Service</i>
<b>3:50-4:10</b>	<a href="#"><u><b>Inclusion of climate change projections into flood frequency analysis using Bayesian statistics – application to the American River and Santiam River</b></u></a> <i>Kara DiFrancesco, Oregon State University</i>
<b>4:10-4:30</b>	<a href="#"><u><b>Effects of Climate Change on Hydrology and Water Management in the Skagit River Basin</b></u></a> <i>Se-Yuen Lee, University of Washington</i>
<b>4:30-4:50</b>	<a href="#"><u><b>Effects of Projected Twenty-First Century Sea Level Rise, Storm Surge, and River Flooding on Water Levels in Puget Sound Floodplains and Estuaries</b></u></a> <i>Joseph Hamman, University of Washington</i>
<b>4:50-5:10</b>	<a href="#"><u><b>Spatio-temporal Modeling of Flood Events over the Columbia River Basin Due to Climate Change</b></u></a> <i>Mohammad Reza Najafi, Portland State University</i>
<b>5:30-7:30</b>	<b>Poster Session - Falcons Room</b>

## Detailed Agenda - Monday Afternoon, 1 October

<b>Day 1 - Concurrent Session B</b> <b>1:30 pm - 5:10 pm - Summit Auditorium</b>	
<b>Conservation</b> <span style="float: right;"><i>Moderator: David Patte</i></span>	
<b>1:30-1:50</b>	<u><a href="#">The Northwest Climate Science Center: science, services, and partnerships</a></u> <i>Gustavo Bisbal, Director, Northwest Climate Science Center</i>
<b>1:50-2:10</b>	<u><a href="#">Prioritizing Landscape Conservation Cooperative Science Needs: Climate as a Critical Driver</a></u> <i>Sean Finn, Great Basin Landscape Conservation Cooperative</i>
<b>2:10-2:25</b>	<u><a href="#">Assessing Aquatic Ecosystem Responses to Climate Change: Linking Science to Adaptive Management</a></u> <i>Clint Muhlfeld, USGS Northern Rocky Mountain Science Center, University of MT</i>
<b>2:25-2:40</b>	<u><a href="#">Climate and Upland Ecosystems: Points of sensitivity and adaptation variability in sagebrush steppe viewed from a single species</a></u> <i>Lar Svenson and Matt Germino, USGS, Forest and Rangeland Eco. Science Center</i>
<b>2:40-2:55</b>	<u><a href="#">Modeling climate change effects on the hydrology of Pacific Northwest wetland ecosystems</a></u> <i>Maureen Ryan, University of Washington</i>
<b>2:55-3:10</b>	<u><a href="#">Ecological Minimums Required by Greater Sage-grouse: Understanding Fundamental Relationships for Tracking Future Habitat Distributions</a></u> <i>Steven Knick, U.S. Geological Survey</i>
<b>3:10-3:30</b>	Break
<b>Agriculture</b> <span style="float: right;"><i>Moderator: Chad Kruger</i></span>	
<b>3:30-3:45</b>	<u><a href="#">Overview</a></u> <i>Chad Kruger, Director, <a href="#">Center for Sustaining Agriculture and Natural Resources (CSANR)</a>, Washington State University</i>
<b>3:45-5:10</b>	<u><a href="#">Panel discussion</a></u> <i>Leaders of large regional Agriculture projects</i> <u><a href="#">Jennifer Adam</a>, <a href="#">Arron Carter</a>, <a href="#">Elizabeth Whitefield</a></u> <i>Washington State University</i> <u><a href="#">Sanford Eigenbrode</a></u> <i>University of Idaho</i> <i>Topics:</i> <i>Breadth and depth of currently funded transdisciplinary ag/climate projects</i> <i>Benefits and challenges of conducting transdisciplinary, integrated projects</i> <i>How to increase better cross-project integration</i> <i>"Next steps" for coordination of regional ag/climate science</i>
<b>5:30-7:30</b>	<b>Poster Session - Falcons Room</b>



## Detailed Agenda - Tuesday Morning, 2 October

<b>Day 2 - Morning Plenary</b> <b>8:30 am - 12:00 pm - Summit Auditorium</b>	
<b>7:30 - 8:30 On-site Registration</b>	
<b>Climate Variability</b> <span style="float: right;">Moderator: Francis Zwiers</span>	
<b>8:30-8:55</b>	<u><a href="#">Climate variability of the Pacific Northwest</a></u> <i>Nick Bond, University of Washington, JISAO</i>
<b>8:55-9:20</b>	<u><a href="#">Projected climate scenarios for the Pacific Northwest (CMIP5)</a></u> <i>John Abatzoglou, University of Idaho</i>
<b>Vulnerability Assessments</b> <span style="float: right;">Moderator: Francis Zwiers</span>	
<b>9:20-9:40</b>	<u><a href="#">The Pacific Northwest Climate Change Vulnerability Assessment</a></u> <i>Michael Case and Joshua Lawler, University of Washington</i>
<b>9:40-10:00</b>	<u><a href="#">Climate change in grasslands, shrublands, and deserts of the interior American West: a review and needs assessment</a></u> <i>Deborah Finch, U.S. Forest Service, Rocky Mountain Research Station</i>
<b>10:00-10:30</b>	Break
<b>Climate Change Communication</b> <span style="float: right;">Moderator: David Patte</span>	
<b>10:30-10:40</b>	<u><a href="#">Review of Climate Change Communications</a></u> <i>David Patte, U.S. Fish and Wildlife Service</i>
<b>10:40-11:00</b>	<u><a href="#">Climate Communications and Behavior Change - Trends and Opportunities</a></u> <i>Cara Pike, Director, Social Capital Project</i>
<b>11:00-11:20</b>	<u><a href="#">Communicating Climate Science to Nonscientists and Politicians</a></u> <i>Gwen Griffith, DVM, MS; Cumberland River Compact; Curriculum Director for Climate Solutions University, a program of the Model Forest Policy Program</i>
<b>11:20-11:40</b>	<u><a href="#">Place-based Climate Change Education</a></u> <i>Jessica Thompson, Northern Michigan University</i>
<b>11:40-12:00</b>	<u><a href="#">Climate Change Youth Ambassadors</a></u> <i>Aneka Singlaub, North Cascades Institute</i>
<b>12:00-1:30</b>	Lunch (on your own)

## Detailed Agenda - Tuesday Afternoon, 2 October

<b>Day 2 - Concurrent Session A</b> <b>1:30 pm - 5:00 pm - Waters Room</b>	
<b>Terrestrial</b> <span style="float: right;">Moderator: Lief Horwitz</span>	
1:30-1:45	<u><a href="#">Indicators of climate change in Idaho: The intersection of biophysical change with social perception across a diverse landscape</a></u> <i>Zion Klos, University of Idaho</i>
1:45-2:00	<u><a href="#">Cheatgrass and dieoff mapping in the Northern Great Basin</a></u> <i>Don Major, U.S. Dept of Interior, Bureau of Land Management - Idaho</i>
2:00-2:15	<u><a href="#">Assessing climate change impacts on forest management and hydrology: new data, new results</a></u> <i>Guillaume Mauger, Climate Impacts Group, University of Washington</i>
2:15-2:30	<u><a href="#">Cold Vulnerability in a Warming World: Changes in spring False Starts in the Pacific Northwest</a></u> <i>Alexander Peterson, University of Idaho</i>
2:30-2:45	<u><a href="#">Charred Forests Increase Snowmelt: Effects of Soot and Burnt Woody Debris on Snow Albedo</a></u> <i>Anne Nolin, Oregon State University</i>
2:45-3:00	<b>Modeling potential effects of climate change on aspen and associated bird communities</b> <i>Susan Earnst, U.S. Geological Survey</i>
3:00-3:30	Break
<b>Aquatics</b> <span style="float: right;">Moderator: Von P. Walden</span>	
3:30-3:45	<u><a href="#">Addressing Ecological Resource Impacts in a Changing Climate in the Bureau of Reclamation</a></u> <i>Toni Turner, U.S. Bureau of Reclamation</i>
3:45-4:00	<u><a href="#">NorWeST: A Stream Temperature Database and Model for All Streams in the Northwest</a></u> <i>Dan Isaak, U.S. Forest Service, Boise</i>
4:00-4:15	<u><a href="#">Observed coastal ocean chlorophyll variability during 1997-2010</a></u> <i>Todd Mitchell, Climate Impacts Group, University of Washington</i>
4:15-4:30	<u><a href="#">Incorporating Climate Change Vulnerability into a Regional Aquatic Restoration Priorities Decision Support Tool</a></u> <i>Jocelyn Tutak, EcoTrust</i>
<b>Closing (Plenary Session in the Summit Auditorium)</b>	
4:45-5:00	<b>Closing Remarks</b> <i>Von P. Walden, University of Idaho</i>

## Detailed Agenda - Tuesday Afternoon, 2 October

<b>Day 2 - Concurrent Session B</b> <b>1:30 pm - 5:00 pm - Summit Auditorium</b>	
<b>Adaptation</b> <span style="float: right;"><i>Moderator: Robert Elleman</i></span>	
<b>1:30-1:45</b>	<b>California climate change and landscape connectivity</b> <i>Jason Kreidler, Western Geographic Science Center, USGS</i>
<b>1:45-2:00</b>	<a href="#"><u>Influences Of Greenhouse Gas Emission Reduction Options On Water Use In Energy Production: Implications for the Columbia River Basin</u></a> <i>Craig Cooper, Idaho National Laboratory</i>
<b>2:00-2:15</b>	<a href="#"><u>Development of a National Adaptive-Integrated Water Resources Management (A-IWRM) Framework</u></a> <i>Gerald Sehlke, Idaho National Laboratory</i>
<b>2:15-2:30</b>	<a href="#"><u>The Impacts of Climatic and Water Supply Conditions on Agricultural Land Use Decisions in Idaho</u></a> <i>Scott Lowe, Boise State University</i>
<b>2:30-2:45</b>	<a href="#"><u>British Columbia Agriculture Climate Change Adaptation Risk &amp; Opportunity Assessment</u></a> <i>Erica Crawford and Trevor Murdock, BC Ag &amp; Food Climate Action Initiative, PCIC</i>
<b>2:45-3:00</b>	<a href="#"><u>Visualization and Costing of Adaptation to Sea Level Rise in Metro Vancouver</u></a> <i>Tina Neale, BC Ministry of Environment</i>
<b>3:00-3:30</b>	Break
<b>Human Health</b> <span style="float: right;"><i>Moderator: Trevor Murdock</i></span>	
<b>3:30-3:45</b>	<a href="#"><u>The Health Impacts of Climate Change</u></a> <i>Andrea Hamberg, Oregon Health Authority</i>
<b>3:45-4:00</b>	<a href="#"><u>Extreme heat and health impacts in Oregon</u></a> <i>Mandy Green, Oregon Health Authority</i>
<b>4:00-4:15</b>	<a href="#"><u>Marine Pathogens as Indicators of Global Climate Change</u></a> <i>Richard Lillie, Washington Department of Health</i>
<b>4:15-4:30</b>	<b>Modeling favorable habitat for harmful algal blooms in Puget Sound: present-day and future climate pathways and transport patterns</b> <i>Stephanie Moore, NOAA Northwest Fisheries Science Center</i>
<b>Closing (Plenary Session in the Summit Auditorium)</b>	
<b>4:45-5:00</b>	<b>Closing Remarks</b> <i>Von P. Walden, University of Idaho</i>

<b><i>Agriculture</i></b>
<a href="#"><u>BIOEARTH: A REGIONAL-SCALE EARTH SYSTEM MODEL TO INFORM AGRICULTURAL AND NATURAL RESOURCE MANAGEMENT DECISIONS</u></a> - Adam, Jennifer
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<a href="#"><u>ANALYSIS OF EDDY COVARIANCE FLUX MEASUREMENTS IN ROLLING AND FLAT TERRAIN AT FOUR AGRICULTURAL SITES IN THE PACIFIC NORTHWEST</u></a> - Chi, Jinshu
<a href="#"><u>THE CEREAL LEAF BEETLE AND ITS PARASITOID UNDER PROJECTED CLIMATES IN THE PACIFIC NORTHWEST</u></a> - Eigenbrode, Sanford
<a href="#"><u>REACCH: CHANGE AND PNW AGRICULTURE</u></a> - Eigenbrode, Sanford
<a href="#"><u>FACING FACTS: PNW BIODIESEL AND AVIATION FUEL FEEDSTOCK PRODUCTION</u></a> - Verhey, Steve
<a href="#"><u>PROJECTED CHANGES IN AGROECOLOGICAL INDICATORS FOR THE PACIFIC NORTHWEST, USA</u></a> - Hegewisch, Katherine
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<a href="#"><u>CO2 EDDY COVARIANCE FLUX MEASUREMENTS AT FOUR AGRICULTURAL SITES UNDER DIFFERENT CROP MANAGEMENT PRACTICES IN THE PACIFIC NORTHWEST</u></a> - Baxter, Heather
<a href="#"><u>THE ROLE OF THE USDA FUNDED TCAP GRANT IN ADDRESSING WHEAT AND BARLEY BREEDING IN A CHANGING CLIMATE</u></a> - Carter, Arron
<a href="#"><u>DISTRIBUTION OF EARTHWORMS ACROSS CLIMATIC GRADIENTS IN THE WHEAT GROWING REGIONS OF THE PACIFIC NORTHWEST</u></a> - Walsh, Chelsea
<b><i>Climate Change Communication</i></b>
<a href="#"><u>COMMUNICATING CURRENT CLIMATE RESEARCH THROUGH HIGH SCHOOL SCIENCE CURRICULUM</u></a> - White, Troy
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<a href="#"><u>HELLO CLIMATE CHANGE: A TEDX CONFERENCE</u></a> - Verhey, Steve

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